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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,838	02/01/2001	Toshio Hata	299002051900	1157
25226	7590	06/07/2004	EXAMINER	
MORRISON & FOERSTER LLP			LE, THAO X	
755 PAGE MILL RD			ART UNIT	
PALO ALTO, CA 94304-1018			PAPER NUMBER	
			2814	

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/775,838	HATA ET AL.	
	Examiner	Art Unit	
	Thao X Le	2814	

-- Th MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-11 and 15-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6-11 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 2, 12-14 are cancelled.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1, 3-4, 9 are rejected under 35 U.S.C. 102(e) as being anticipated US 6542526 to Niwa et al.

Regarding to claim 1, Niwa discloses in fig. 23D a gallium nitride (GaN) compound semiconductor light emission device comprising: a substrate 51, column 30 line 54, a n-type electrode region 53/59 comprising an n-type transmissive electrode 59 column 30 line 65, a GaN compound semiconductor multiplayer structure 54/55/56, fig. 23D, including active layer 55,

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column 30 line 50, a p-type electrode region 57/58 comprising a p-type transmissive electrode 58, column 30 line 61, wherein the n-type transmissive electrode and p-type transmissive electrode substantially transparent, and the p-type transmissive electrode and the n-type transmissive electrode transmit light which is generated in the active layer 55 and reflect from the substrate so that light exits the light emission device.

The recitation of 'and reflect from the substrate so that light exits the light emission device' is only a statement of the inherent properties of the structure. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Regarding to claims 3-4, Niwa discloses a GaN compound LED, wherein the n-type transmissive electrode 59 is located outside and is formed at least partially or completely around a circumference of the p-type transmissive electrode, fig. 23D. The fig. 23D is the side view of the device and the top view (not shown) would have shown the surrounding structure as claimed.

Regarding to claim 9, Niwa discloses a GaN compound LED wherein the n-type transmissive electrode comprises at least one of the thin metal film, column 24 line 51.

4. Claims 1, 3-4, 6-11, 16 are rejected under 35 U.S.C. 102(e) as being anticipated US 6172382 to Nagahama et al.

Regarding to claim 1, Nagahama discloses in fig. 2 a gallium nitride (GaN) compound semiconductor light emission device comprising: a GaN substrate 10, column 19 line 8, a n-type electrode region 12, column 18 line 21, comprising an n-type transmissive electrode 23, column 18 line 50, a GaN compound semiconductor multiplayer structure 515/16/17/18, fig. 2, including active layer 16, column 18 line 19, a p-type electrode region 20, column 18 line 26, comprising a p-type transmissive electrode 21, column 18 line 60, wherein the n-type transmissive electrode and p-type transmissive electrode substantially transparent, and the p-type transmissive electrode and the n-type transmissive electrode transmit light which is generated in the active layer 16 and reflect from the substrate so that light exits the light emission device.

The recitation of 'and reflect from the substrate so that light exits the light emission device' is only a statement of the inherent properties of the structure. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

Regarding to claims 3-4, Nagahama discloses a GaN compound LED, wherein the n-type transmissive electrode 23 is located outside and is formed at least partially around a circumference of the p-type transmissive electrode 21, fig. 2, which is the side view of the device and the top view (not shown) would have shown the surrounding structure as claimed.

Regarding claims 6-9, Nagahama discloses a GAN compound LED wherein n-type electrode region 12 further comprises an n-type pad electrode 24, and wherein the p-type electrode region 20 further comprises a p-type pad electrode 22, column 23 lines 44-45, wherein the n-type pad electrode and the p-type pad electrode are provided substantially along one side of a light emitting face of the gallium nitride compound semiconductor light emission device, fig. 2, wherein the p-type pad electrode 22 is formed in the vicinity of a center of a light emitting face of the gallium nitride compound semiconductor light emission device, fig. 2, wherein the n-type transmissive electrode comprises at least one of the thin metal film, column 20 line 57

Regarding to claim 10, Nagahama discloses a gallium nitride compound semiconductor LED wherein the n-type pad electrode is of a type, which realizes a Schottky contact.

Regarding to claim 11, Nagahama discloses a gallium nitride compound semiconductor LED device wherein the n-type electrode comprises an Al, column 20 line 57.

Regarding to claim 16, Nagahama discloses the GaN compound semiconductor LED wherein the n-type transmissive electrode 23 is formed completely around the circumference of the p-type transmissive electrode 22. The top view of fig. 2 would show the n-type electrode 23 surrounding the p-type electrode 22. Such view would be comparable to the fig. 4 of the instant application.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6171382 to Nagahama et al. in view of US 5309001 to Watanabe et al.

Regarding to claim 15, Nagahama discloses in fig. 2 a GaN compound semiconductor LED comprising: a GaN substrate 2, a n-type electrode region 12 comprising an n-type transmissive electrode 23, a GaN compound semiconductor multiplayer structure 15/16/17/18 including active layer 16, a p-type electrode region 19 comprising a p-type transmissive electrode 22, wherein the n-type transmissive electrode 23 comprises Al, column 20 line 57 and p-type transmissive electrode are film so as to be substantially transparent, wherein the n-type transmissive electrode and p-type transmissive electrode substantially transparent, and the p-type transmissive electrode and the n-type transmissive electrode transmit light which is generated in the active layer 16 and reflect from the substrate so that light exits the light emission device.

But, Nagahama does not disclose the n-type transmissive electrode comprises a thick film of ITO.

However, Watanabe reference discloses a n-type electrode 317 comprises Al, ITO, column 15 line 40. At the time of the invention was made; it would have been obvious to one of ordinary skill in the art to use the ITO transparent electrode teaching of Watanabe to replace the Al electrode of Nagahama, because such electrode substitution would have been considered a mere substitution of art-recognized equivalent values.

The recitation of 'and reflect from the substrate so that light exits the light emission device' is only a statement of the inherent properties of the structure. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6171382 to Nagahama et al. in view of US 6130446 to Takeuchi et al.

Regarding claim 17, Nagahama does not expressly disclose the n-type and p-type transmissive electrode are of a thickness of 30 nm or less.

However, Nagahama discloses the n-type and p-type electrodes having a general thickness. In addition, Takeuchi discloses the n-type and p-type transmissive electrodes Ni and Au are used as a transparent metal film electrode having different thickness including less than 30nm, see Table 1, column 7 line 30-33 and the transparency can be adjusted by decreasing the thickness, column 1 lines 39-45. Accordingly, it would have

been obvious to one of ordinary skill in art to use the electrode thickness teaching of Takeuchi in Nagahama GaN compound in the range as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. See *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955), and providing electrode having good ohmic contact with an n-type semiconductor without requiring heat treatment as taught by Takeuchi, see Abstract.

Allowable Subject Matter

9. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record does not disclose all the limitations of claim 5 including the n-type transmissive electrode is formed on a side face of the substrate, a side face of the buffer layer, and a side face of the n-type gallium nitride compound semiconductor layer in a region neighboring the buffer layer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thao X. Le
01 June 2004.

LONG PHAM
PRIMARY EX

LONG PHAM
PRIMARY EXAMINER